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FIG 1



AUSTRALIA
Patents Act 1990

ORIGINAL
COMPLETE SPECIFICATION
STANDARD PATENT

Invention Title: **FENCING AND METHOD OF MANUFACTURE
THEREOF**

Applicant: **THE AUSTRALIAN STEEL COMPANY
(OPERATIONS) PTY. LTD.**

The following statement is a full description of this invention, including
the best method of performing it known to me:

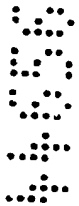
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ABSTRACT

Unitary rigid fencing (1) and a method of manufacturing the fencing (1).
The fencing (1) includes at least two spaced apart, elongate transverse rails (2)
5 and, a plurality of elongate upright pickets(3) spaced along and extending
between the rails (2). Each picket (3) has apertures (8) through which the rails (2)
pass, and the pickets (3) are welded to the rails (2) adjacent the apertures (8) so
as to form a unitary, rigid structure.



FENCING AND METHOD OF MANUFACTURE THEREOF

This invention relates generally to fencing and, in particular, to prefabricated fencing sections or panels for supporting between spaced apart fence posts in order to form an erected fence, as well as a method of manufacturing that fencing. The fencing is applicable to metal fences erected
5 around swimming pools, gardens, homes, sports and playing areas, and between vehicular and pedestrian traffic zones. It will be convenient to hereinafter disclose the invention in relation to that exemplary application, although it should be appreciated that the invention has wider application.

10 A range of metal fences have been previously developed for providing safety and dividing capabilities whilst remaining "open" or non-screening. That range includes open picket style metal fences which typically include fencing panels each having at least two spaced apart transverse members interconnected by a plurality of upright members arranged in spaced apart
15 relation along the transverse members. The transverse members may be in the form of upper and lower rails, whilst the upright members are in the form of individual or "looped together" pickets. In these prior fences, the upright members may extend through apertures in the transverse members, or pass to one side of the transverse members. Interconnection between those members may be
20 achieved by separate clipping, locking or fastening arrangements, including fasteners such as bolts, or by fusing the members together such as by welding. Examples of such fencing are shown in Australian patent applications 38681/78, 58951/90, 67695/81, 13062/83, 77130/87, 77131/87, 64352/90, 84761/91, 41243/93, 56024/96, 57736/96 and 71003/96.

25 Whilst this prior fencing is often satisfactory, the inclusion of separate clipping, locking or fastening arrangements can add to the overall cost of fencing fabrication and fence erection. In addition, some of the fences can have an appearance suggestive of a lack of strength, which may unnecessarily tempt damage to the fence or trespass beyond the fence into areas intended to be
30 excluded by the fence.

An object of the present invention is to provide fencing which is of simple construction yet has an appearance of substantial strength and thus deterrence against challenge.

Another object of the present invention is to provide an inexpensive method of manufacturing attractive and effective barrier fencing.

With these objects in mind, the present invention provides, in one broad aspect, fencing including: at least two spaced apart, elongate transverse members; and, a plurality of elongate upright members spaced along and
5 extending between the transverse members, each upright member having apertures through which the respective transverse members pass, the upright members being connected to the transverse members adjacent the apertures so as to form a unitary, rigid structure.

10 In another broad aspect, the present invention provides a method of manufacturing unitary, rigid fencing, including: providing at least two spaced apart, elongate transverse members; providing a plurality of elongate upright members; forming apertures in the upright members; passing the transverse
15 members through respective apertures so that the upright members are spaced along and extend between the transverse members; and connecting the upright members to the transverse members adjacent the apertures.

The present invention also provides a fence incorporating the above fencing.

This invention is disclosed with reference to the fencing in a normal use
20 orientation, and terms such as "upright" should be construed in the light of this orientation. However, it is to be appreciated that other orientations may be equally possible and that consequential changes in terms such as that above may be required in the light of those other orientations for a proper and complete understanding of the invention.

25 Preferably, the elongate transverse members are rigid rails. An upper and lower rail arranged in parallel spaced apart relation are provided, in one preferred form.

The rails are of any suitable transverse cross-sectional shape, although in one preferred form are circular.

30 Preferably, the rails are tubular.

Preferably, the elongate upright members are arranged in parallel, spaced apart relation along the transverse members. The upright members will generally extend perpendicular to the transverse members, although may extend at other

angles thereto particularly in applications where a fence extends up or down a slope.

Preferably, the upright members each have opposed side faces. The apertures preferably extend through the upright members and open onto the side
5 faces.

Preferably, the upright members each have spaced apart side edges. The apertures are preferably positioned centrally between those side edges.

In one preferred form, the upright members are rectangular in transverse cross-sectional shape. They each have a pair of opposed side faces and a pair
10 of edge faces extending between the side faces, in this form. The upright members are arranged with their side faces extending parallel to one another and perpendicular to the longitudinal extent of the transverse members, in this form. It will be appreciated that other shapes, such as oval, may also be suitable.

The upright members are rigid pickets, in one preferred form. Those
15 pickets have opposite upper and lower ends and, in this form, the rails extend through the pickets adjacent or near those ends.

Preferably, the connection between the transverse and upright members is achieved by fusing them together, such as by welding, adjacent the apertures. In one form, fillet welds are formed between the rails and pickets on at least one
20 side of the pickets in the region of the apertures. The welds may be continuous, or intermittent, or spot fillets about the rails.

Preferably, the transverse and upright members are formed from sheet metal such as by rolling and/or folding appropriately cut metal pieces, and welding those pieces along join zones.

The apertures are formed in the upright members by any suitable means, such as by drilling, punching or cutting. Preferably, the apertures are the same shape as the cross-sectional shape of the transverse members, and are sized so that the upright members can be neatly slid along the transverse members into position.
25

In a preferred arrangement each upright member forms a single picket. However, it is envisaged that in alternative arrangements each upright member may be formed so as to provide more than one picket. By way of example
30

individual upright members may be looped so as to form two or more pickets connected at their adjacent ends through integral loop regions.

The following description refers to a preferred embodiment of the fencing of the present invention. To facilitate an understanding of the invention, reference
5 is made in the description to the accompanying drawings where the fencing is illustrated in that preferred embodiment. It is to be understood that the fencing is not limited to the preferred embodiment as hereinafter described and as illustrated in the drawings.

In the drawings:

10 Fig. 1 is a perspective view of fencing according to one embodiment of the present invention;

Fig. 2 is a plan view of the fencing of Fig. 1;

Fig. 3 is a front view of the fencing of Fig. 1; and

Fig. 4 is a side view of the fencing of Fig. 1.

15 Referring to the drawings, there is generally shown an incomplete length of fencing 1 including a pair of rigid, elongate upper and lower rails 2, extending in parallel, spaced apart relation, and interconnected by a plurality of parallel, spaced apart, rigid, upright pickets 3. The pickets 3 are separate from one another, with each having an elongate transverse axis X. As shown, the pickets
20 are arranged so that the transverse axis X extends perpendicular to the general plane of the rails 2.

The rails 2 are round tubular shaped and are composed of metal such as steel. In this embodiment, the rails 2 have an outside diameter of about 20mm.

The pickets 3 are rectangular tubular shaped and are also composed of
25 metal such as steel. Each picket 3 has opposed upper end 4 and lower end 5. Upper end 4 is closed in this embodiment, whilst lower end 5 may be left open.

Although not shown, the upper end 4 may be provided with a finial or other decorative or security feature. Alternatively, two or more pickets 3 may be interconnected at adjacent ends 4,5 through integral loop regions (not shown).
30 Each picket 3 also has a pair of opposite side faces 6 interconnected with edge faces 7.

In this embodiment, each picket 3 has a side face 6 of about 50mm wide and an edge face about 10mm wide. Each picket 3 is about 1100mm long in this

embodiment. Moreover, the pickets 3 have a centre-to-centre spacing of about 100mm in this embodiment.

5 The pickets 3 are formed from sheet metal by rolling and/or folding appropriately cut metal pieces, and welding those pieces along join zones. The same or separate pieces of sheet metal can close the upper and/or lower ends 4,5, again being welded in position along join zones to form rigid, unitary pickets 3.

10 The pickets 3 are provided with apertures 8 through which the rails 2 pass. Those apertures 8 are located toward the upper and lower ends 4, 5, and centrally between edge faces 7, in this embodiment, although may be otherwise positioned along the pickets 3.

15 The apertures 8 are formed in the pickets 3 by drilling, punching or cutting. Moreover, the apertures 8 are the same circular shape as the cross-sectional shape of the rails 2. The size of the apertures 8 enables the pickets 3 to be neatly slid along the rails into position.

20 The pickets 3 are connected to the rails 2 by fillet welds 9. In this embodiment, a pair of spot fillet welds 9 are provided between each rail 2 and one side face 6 of each picket 3, although it will be appreciated that other weld configurations may be suitable, including continuous, intermittent or spot fillets about the rails 2.

25 In use, the fencing 1 may be manufactured in continuous or indefinite lengths. For practical purposes, however, the fencing 1 will typically be manufactured in discrete lengths to provide fencing sections or panels which are supported between spaced apart fence posts in order to form an erected fence.

30 It will be appreciated from the foregoing description, that the fencing according to the present invention is of simple yet sturdy construction. Moreover, the fencing has an appearance of strength which should provide added deterrents against trespassing beyond the fencing into exclusion areas, or even damage to the fencing.

The arrangement of the transverse and upright members in the fencing means that there is no "front" and "back" to the fence, each side being equally attractive. That may facilitate fence erection. Moreover, because the transverse

members pass through the upright members, there is little likelihood of individual upright members being removed when struck either deliberately or accidentally.

Finally, it is to be understood that various alterations, modifications and/or additions may be made to the fencing and its method of manufacture without
5 departing from the ambit of the present invention as defined herein.

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The claims defining the invention are as follows:

1. Fencing including: at least two spaced apart, elongate transverse members; and, a plurality of elongate upright members spaced along and extending between the transverse members, each upright member having
5 apertures through which the respective transverse members pass, the upright members being connected to the transverse members adjacent the apertures so as to form a unitary, rigid structure.
2. Fencing as claimed in claim 1, wherein the upright members each have opposed side faces and the apertures extend through the upright members and
10 open onto the side faces.
3. Fencing as claimed in claim 1 or 2, wherein the upright members each have spaced apart side edges, and the apertures are positioned centrally between the side edges.
4. Fencing as claimed in any preceding claim, wherein the upright members
15 are rectangular in transverse cross-sectional shape, providing a pair of opposed side faces and a pair of edge faces extending between the side faces.
5. Fencing as claimed in claim 4, wherein the upright members are arranged with their side faces extending parallel to one another and perpendicular to the longitudinal extent of the transverse members.
- 20 6. Fencing as claimed in any preceding claim, wherein the upright members are rigid, tubular pickets.
7. Fencing as claimed in any preceding claim, wherein the apertures are of the same shape as the shape of the transverse members and sized to neatly receive the transverse members therethrough.
- 25 8. Fencing as claimed in any preceding claim, wherein the transverse members are circular in transverse cross sectional shape.
9. Fencing as claimed in any preceding claim, wherein the transverse members are rigid, tubular rails.
10. Fencing as claimed in any preceding claim, wherein the transverse and
30 upright members are connected by fusing together adjacent the apertures.
11. Fencing as claimed in any preceding claim, wherein the transverse and upright members are connected together with fillet welds formed therebetween adjacent the apertures.

12. Fencing as claimed in any preceding claim, wherein the transverse and upright members are composed of metal.
13. Fencing, substantially as hereinbefore described with reference to what is shown in the accompanying drawings.
- 5 14. A method of manufacturing unitary, rigid fencing, including: providing at least two spaced apart, elongate transverse members; providing a plurality of elongate upright members; forming apertures in the upright members; passing the transverse members through respective apertures so that the upright members are spaced along and extend between the transverse members; and connecting
- 10 the upright members to the transverse members adjacent the apertures.
15. A method as claimed in claim 14, wherein the upright members are provided with opposed side faces, and the apertures are formed so as to extend through the upright members and open onto the side faces.
16. A method as claimed in claim 14 or 15, wherein the upright members are
- 15 provided with spaced apart side edges, and the apertures are formed centrally between the side edges.
17. A method as claimed in any one of claims 14 to 16, wherein providing the upright members includes forming the members from sheet material.
18. A method as claimed in claim 17, wherein formation of each upright
- 20 member includes rolling and/or folding a sheet material piece into a rectangular, tubular shape in transverse cross section, and welding the piece along join zones.
19. A method as claimed in any one of claims 14 to 18, wherein each upright member is, in succession, connected to the transverse members prior to positioning of a successive upright member.
- 25 20. A method as claimed in any one of claims 14 to 19, wherein the apertures are formed in the same shape as the shape of the transverse members and sized to slidably receive the transverse members therethrough.
21. A method as claimed in any one of claims 14 to 20, wherein connecting the upright members to the transverse members includes fusing the members
- 30 together.
22. A method as claimed in any one of claims 14 to 21, wherein connecting the upright members to the transverse members includes fillet welding the members together.

23. A method as claimed in any one of claims 14 to 22, wherein the transverse and upright members are formed of metal.

24. A method of manufacturing unitary, rigid fencing, substantially as hereinbefore described with reference to what is shown in the accompanying
5 drawings.

25. Fencing when manufactured in accordance with the method as claimed in any one of claims 14 to 24.

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